PROJECTING THE PARTICIPATION RATE

Presentation for the SSAB technical panel
on labor force participation

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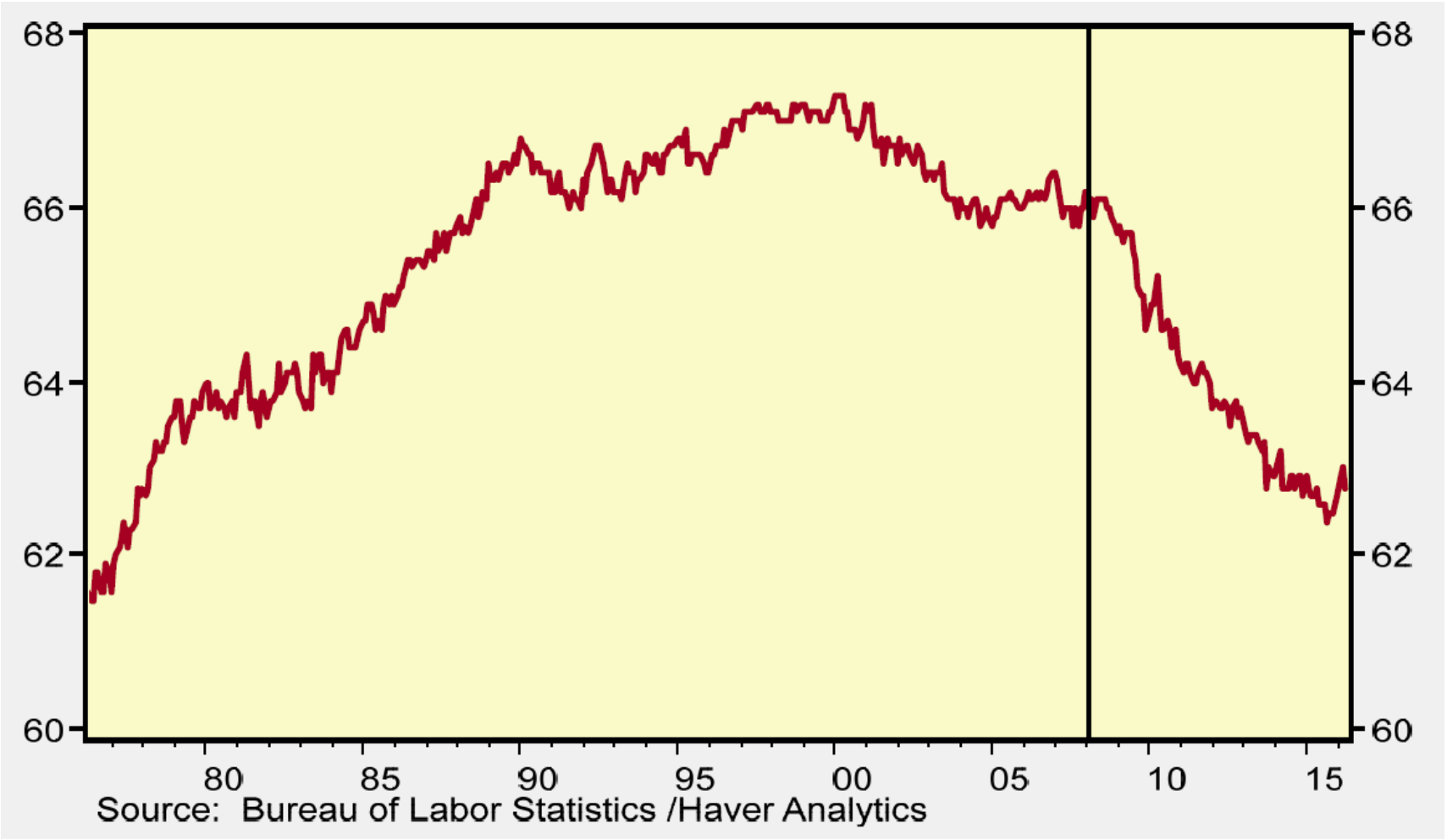
May 2016

Aaronson et al, 2014

- The work presented here is drawn from a recent paper: “Labor Force Participation: Recent Developments and Future Prospects” by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, *Brookings Papers on Economic Activity*, Fall 2014.

- The analysis and conclusions represent the views of the authors and not the views of the Board of Governors, the Federal Reserve System, or any of its staff.

Labor Force Participation Rate



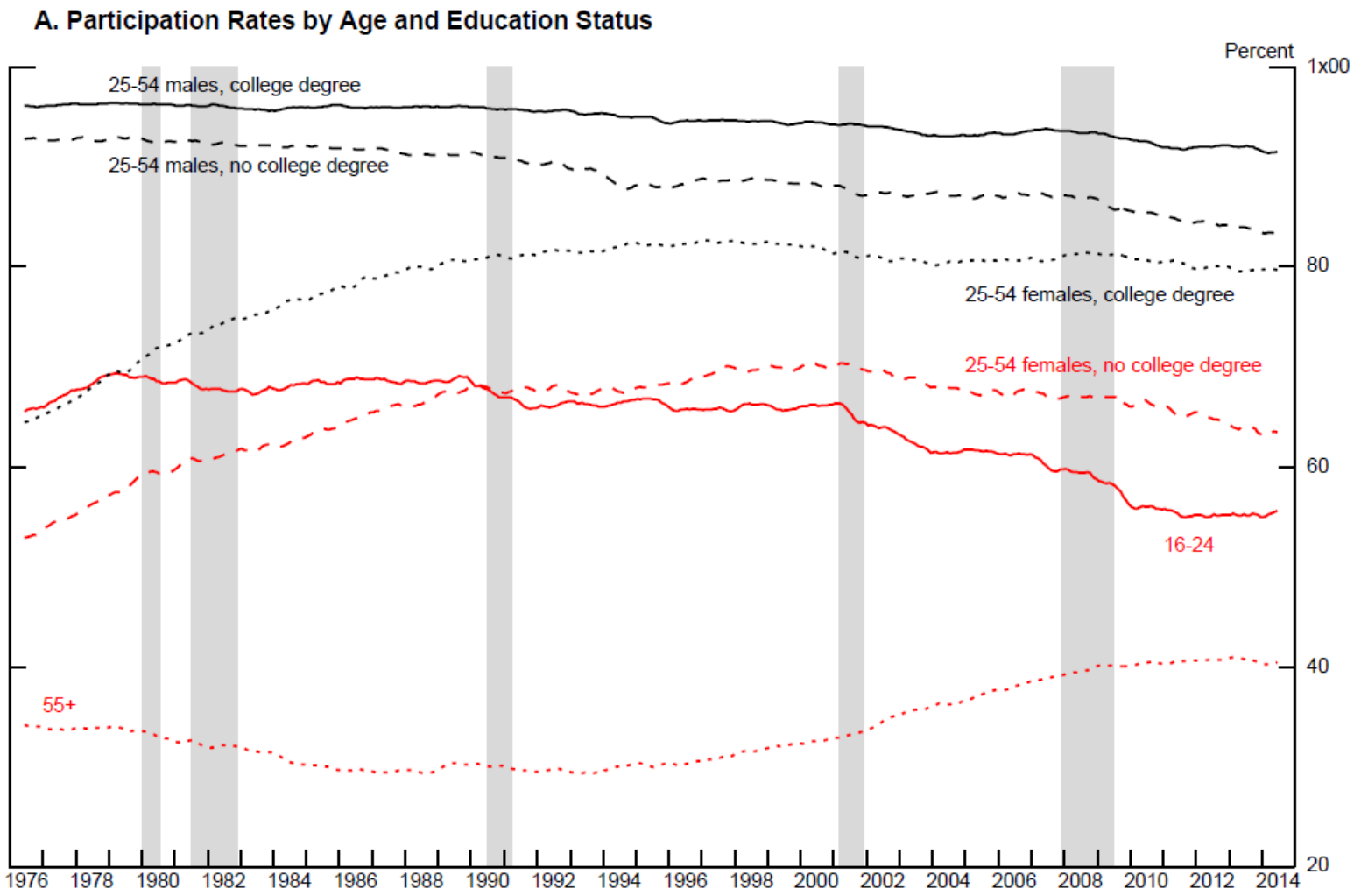
Overview

- Projections for the participation rate from Aaronson, Cajner, Fallick, Galbis-Reig, Smith, and Wascher, 2014.

Year	Authors' Model	Congressional Budget Office	Bureau of Labor Statistics	Social Security Administration	International Monetary Fund
Labor force participation rate (percent)					
2012	63.7	63.7	63.7	63.7	63.7
2013	63.4	63.3	63.5	63.3	63.3
2014	63.1	62.9	63.3	63.1	63.0
2015	63.0	62.7	63.1	63.2	63.0
2016	62.7	62.5	63.0	63.2	62.9
2017	62.3	62.4	62.7	63.2	62.8
2018	62.1	62.2	62.5	63.3	62.6
2019	61.8	62.0	62.3	63.3	62.3
2020	61.5	61.8	62.0	63.3	-
2021	61.2	61.5	61.8	63.1	-
2022	61.0	61.3	61.6	62.9	-

Sources: Authors' calculations; Congressional Budget Office (2014); Toossi (2013); Social Security Administration (2014, unpublished data), International Monetary Fund (2014).
Note: Author's projections are for the annual average participation rate, as are those from the CBO, the SSA, and the International Monetary Fund. BLS projections are for the annual average trend participation rate.

Participation Rates by Age and Ed.



Note: 6-month moving averages. Data are seasonally adjusted by authors.
Source: Current Population Survey microdata.

A Cohort Model

The Model has the form:

$$\log\left(\frac{lfpr_{a,t,s}}{1-lfpr_{a,t,s}}\right) = \mathrm{A}_{a,s} + \mathrm{K}_{t-a,s} + X_{a,t,s}\lambda_{a,s} + \varepsilon_{a,t,s}$$

where lfpr = the seasonally adjusted labor force participation rate expressed as a fraction,

a = age (in single years), 16 to 79

t = calendar time (in quarters)

s = sex

A = an age-and-sex-specific constant, i.e., an “age effect”

K = a birth-year-and-sex-specific constant, i.e., a “cohort effect”

X = a vector of variables that may vary by age, time and/or sex

λ = a vector of coefficients, which generally vary by both age and sex. Some coefficients are constrained to be zero for some age-sex groups.

ε = an i.i.d. error term.

Variables

A. The aggregate *unemployment rate gap*, divided into positive and negative components. We use the long-term natural rate estimated by the CBO to define the unemployment rate gap. Includes the contemporaneous gaps and lags at 4-, 8-, and 12- quarters.

B. The aggregate *personal bankruptcy rate*, as a percent of the population.

C. The percent of each age-sex group with a *college degree*. .

D. *Life expectancy* conditional on survival to each age, 55 to 79. Intended to capture both mortality and morbidity. Census Bureau estimates for ages 55 and over by sex.

E. The *Social Security "pay-out rate."* This is the average fraction of the Primary Insurance Amount (PIA) a person would receive if he or she were to retire at a particular age.

Variables Continued…

F. *Marriage and young children.* The percentage of women who are married with a child less than 6 years old, the percentage of women who are not married with a child less than 6 years old, and the percentage of women married without a child less than 6 years old.

G. The ratio of the effective *minimum wage*, adjusted to account for state-level minimum wages above the federal level, relative to ave. hrly earnings.

H. The ratio of the *median hourly wage rate for ages 16-19* to the median hourly wage rate for ages 25 plus, intended to reflect movements in the relative demand for teenagers.

I. The ratio of summer to non-summer *school enrollment rates*, by age and sex, among teenagers.

J. The number of *Social Security Disability Insurance* recipients, by age and sex.

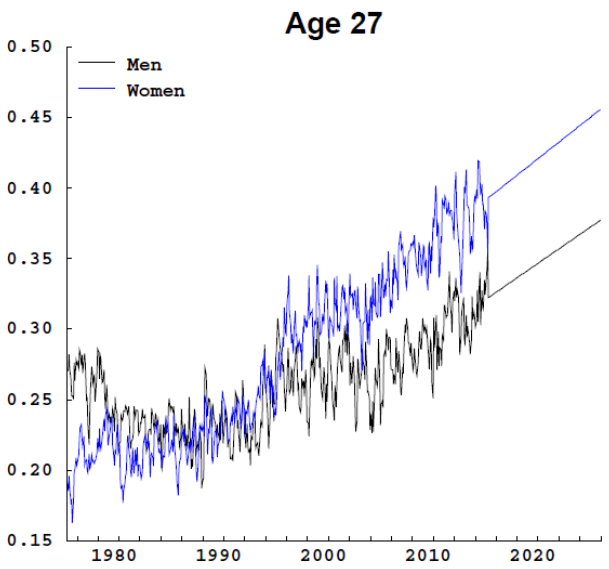
Contributions to the Change in LFPR, 2007:Q4 to 2014:Q2 (Percentage Points)

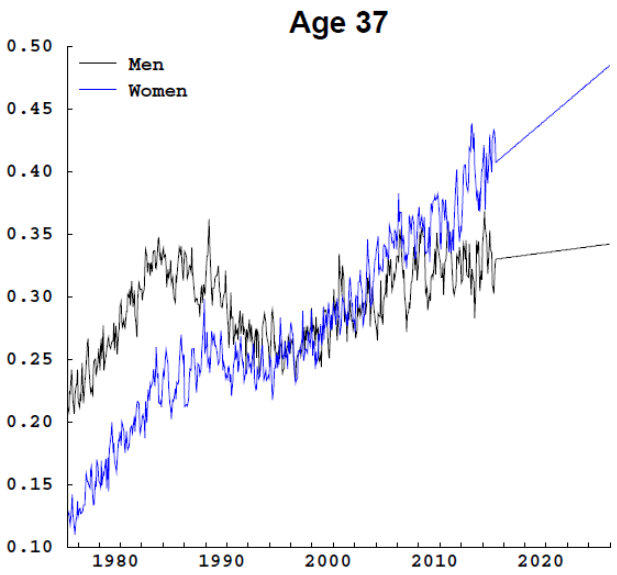
Source	Contribution
Age Distribution	-1.3
Cohort Effects	-1.7
Unemployment Rate Gap	-0.3
Bankruptcy Rate	-0.2
Percent with College Degree	+0.2
Life Expectancy	+0.3
Social Security Pay-Out Rate	+0.1
Marriage x young children	+0.8
Minimum Wage	0.0
Teenage Wage Ratio	0.0
Summer Enrollment Ratio	0.0
Disability Insurance	-0.5
Model Residual	-0.2

From “Labor Force Participation: Recent Developments and Future Prospects” by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, FEDS WP 2014-64, September 2014.

Some examples of extrapolations of explanatory variables

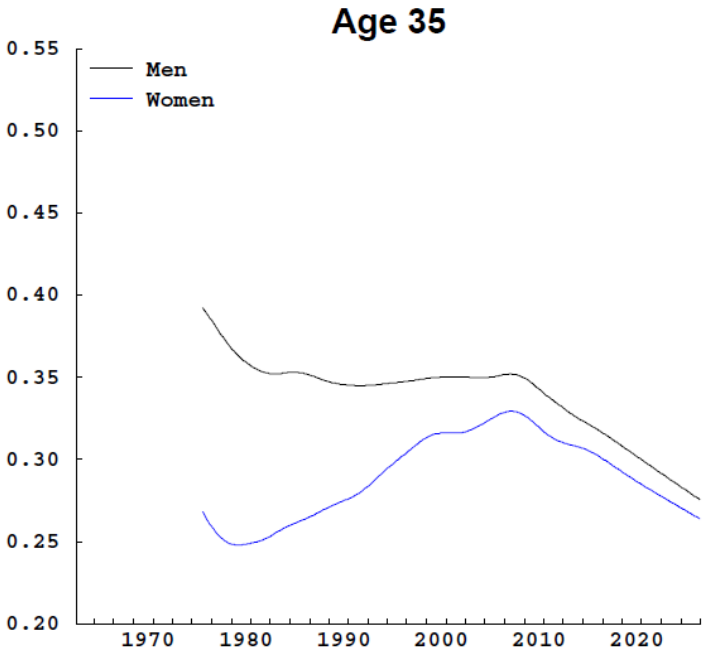
Percent with college degree

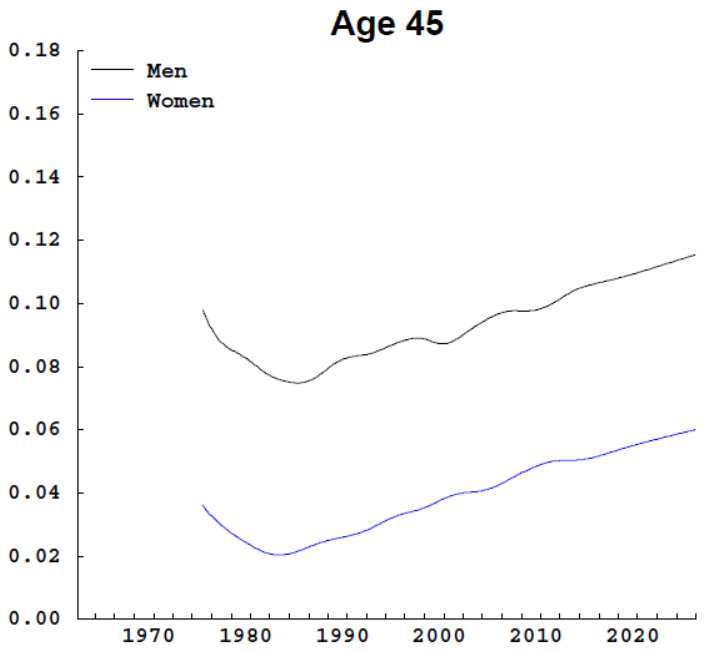




Some examples of extrapolations of explanatory variables 2

Married with children under 6





Contributions to the Change in LFPR 2016:Q1-2024:Q4

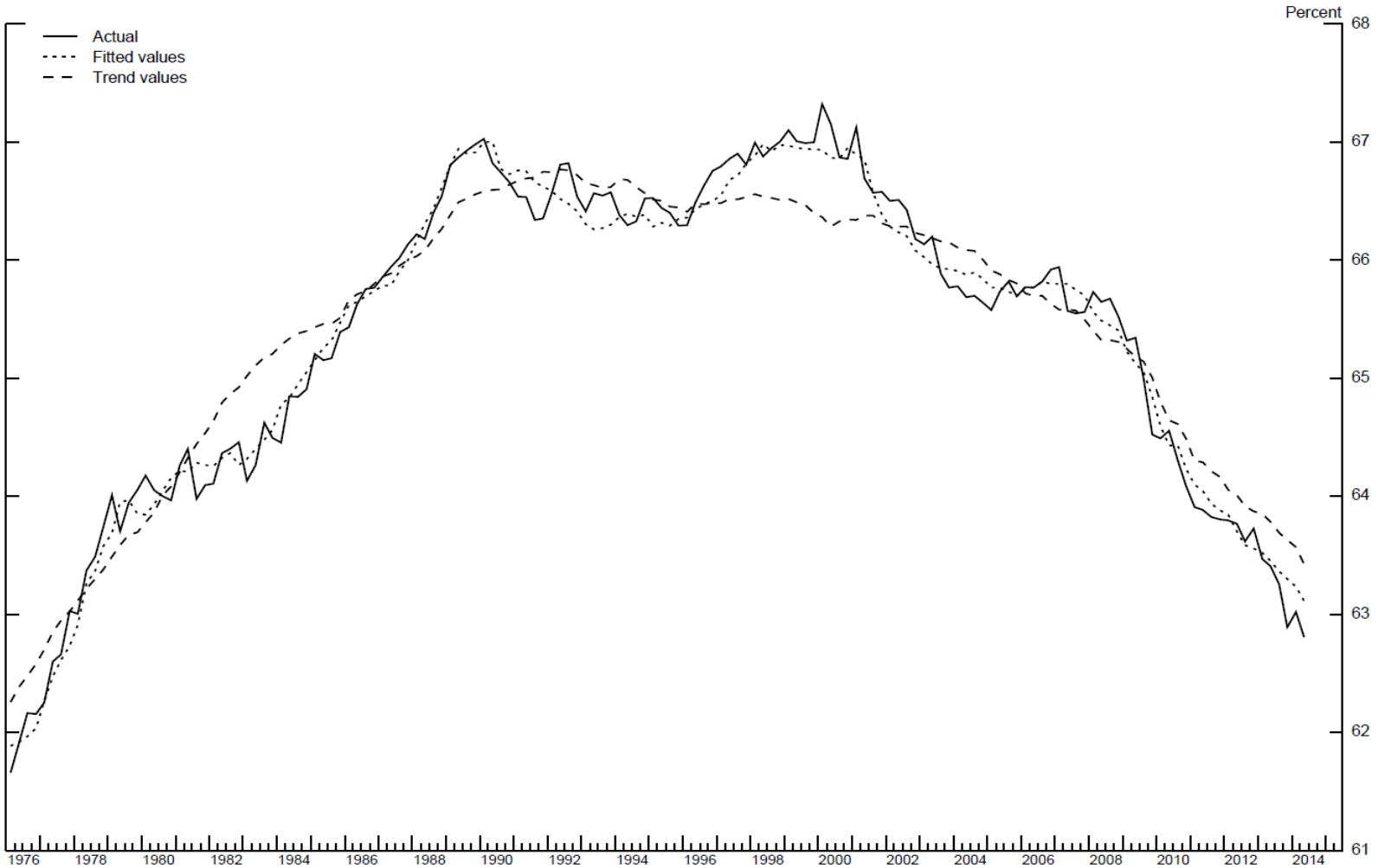
Source	Contribution
Age Distribution	-2.1
Unemployment Rate Gap	0
Bankruptcy Rate	0.2
Percent with College Degree	0.3
Life Expectancy	0.7
Social Security Pay-Out Rate	0.2
Marriage	1.1
Minimum Wage	0
Teenage Wage Ratio	0
Summer Enrollment Ratio	0
Disability Insurance	0

Model Projections

	Projections		
	1	2	3
	Equation (1)	Model	
		Hold incoming cohort effects and most variables constant	Hold incoming cohort effects constant and extrapolate all other variables
2014:Q2	62.8	63.1	63.1
2015:Q2	62.6	62.9	63.0
2016:Q2	62.3	62.5	62.7
2017:Q2	62.0	62.0	62.4
2018:Q2	61.8	61.5	62.1
2019:Q2	61.6	61.1	61.8
2020:Q2	61.3	60.6	61.5
2021:Q2	61.0	60.2	61.3
2022:Q2	60.7	59.8	61.0
2023:Q2	60.4	59.3	60.7
2024:Q2	60.2	58.9	60.4

From “Labor Force Participation: Recent Developments and Future Prospects” by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, FEDS WP 2014-64, September 2014.

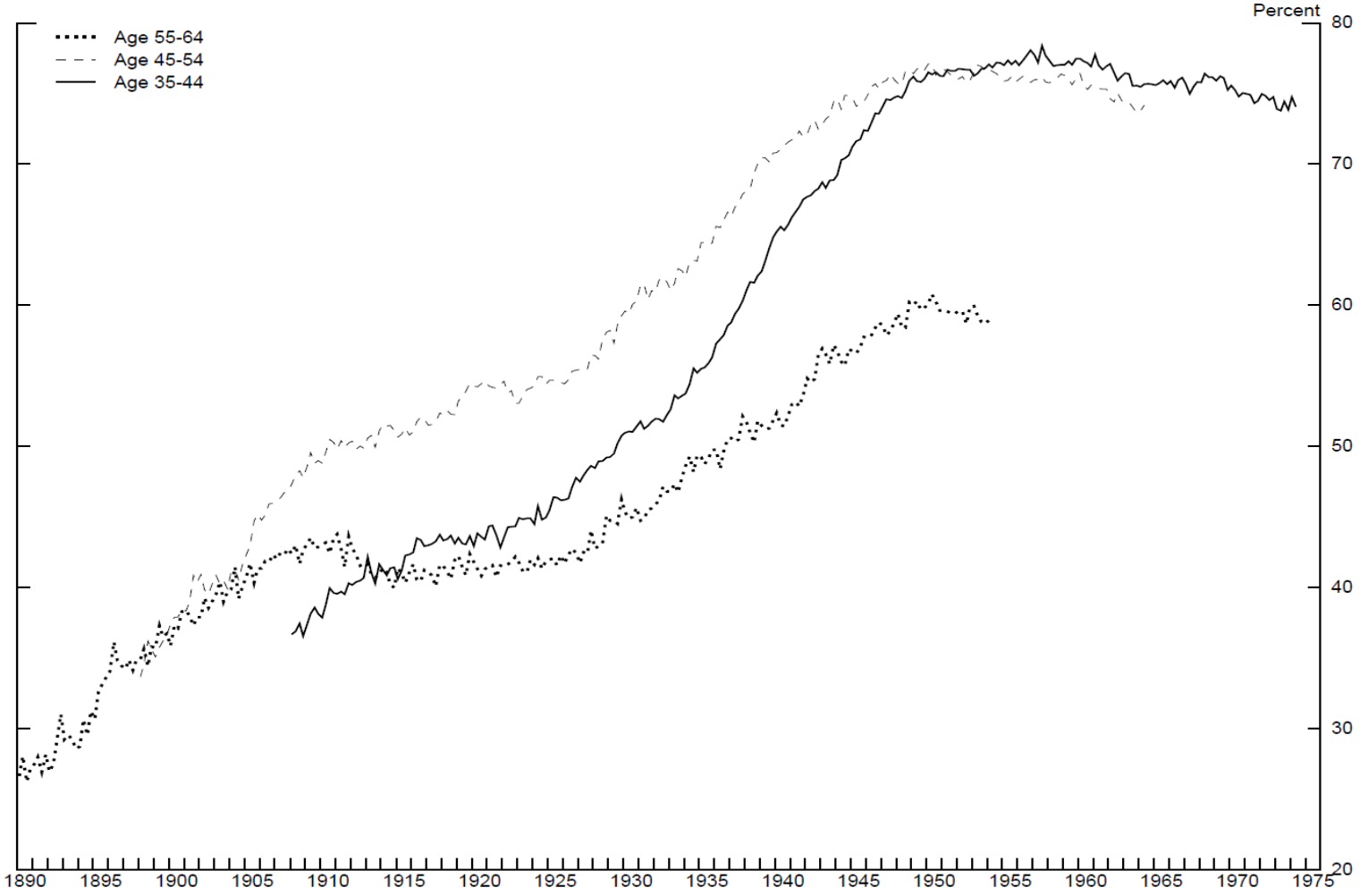
Results of Model



Source: Authors' calculations.

From "Labor Force Participation: Recent Developments and Future Prospects" by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, FEDS WP 2014-64, September 2014.

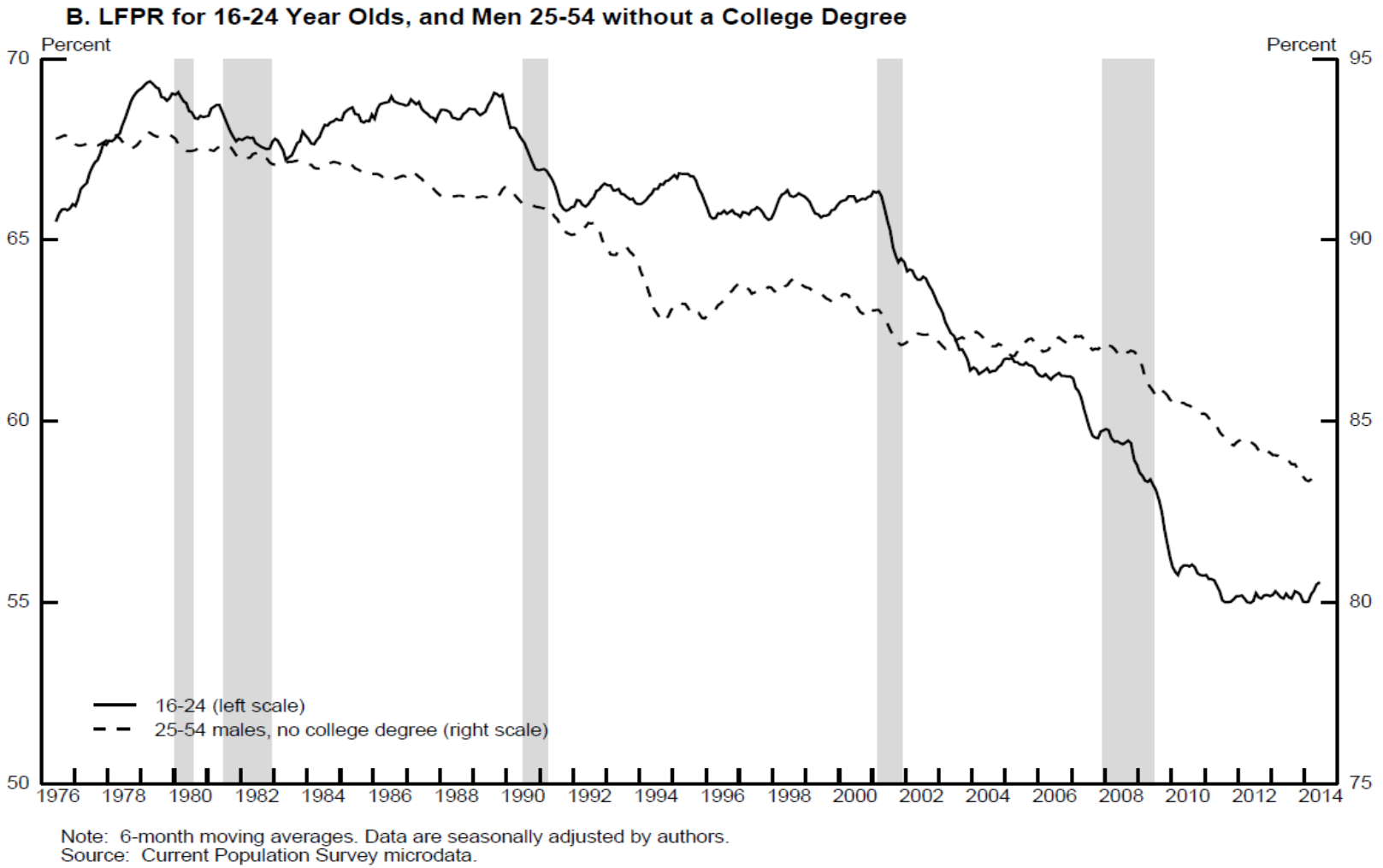
Actual labor force participation rates for women by cohort



Source: Current Population Survey.

From “Labor Force Participation: Recent Developments and Future Prospects” by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, FEDS WP 2014-64, September 2014.

Participation Among Teens and Young Adults



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Source: Current Population Survey microdata.

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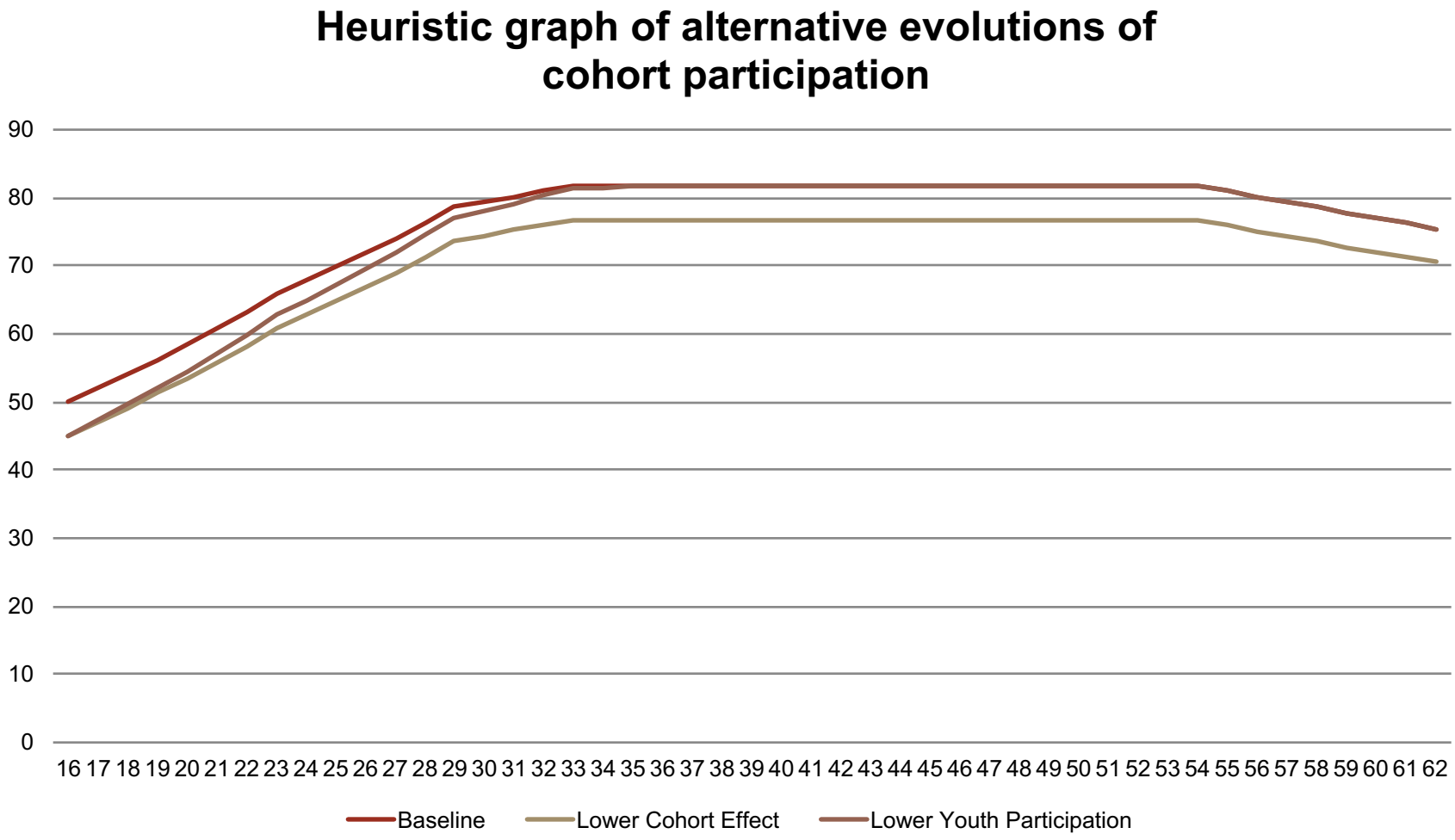
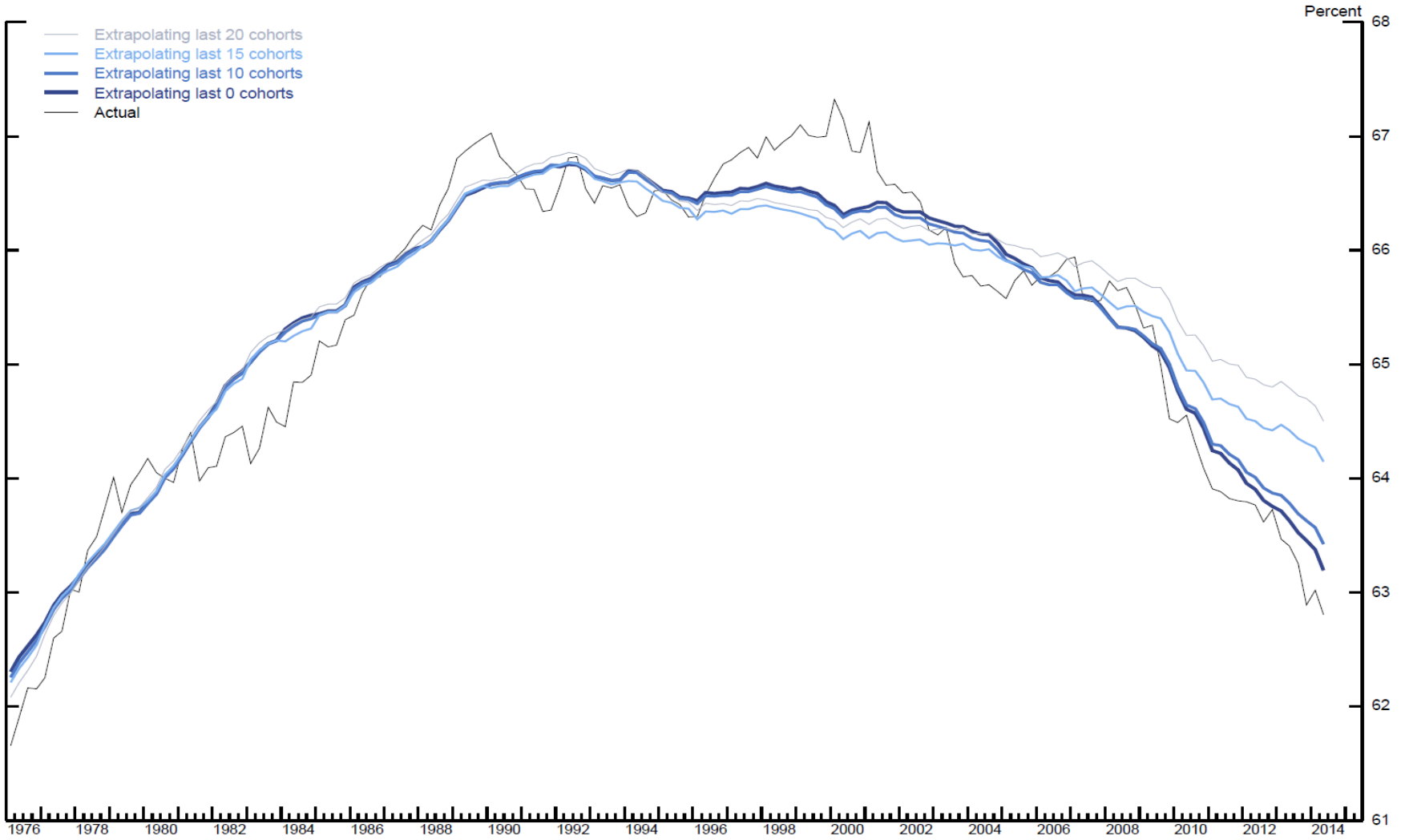
Cohort Assumptions



Estimating Cohort Effects

- We estimate cohorts for men and women by year.
- Because we would only observe a few observations for the most recent 10 cohorts, and because they largely coincide with the great recession, we don't estimate them, but extrapolate them linearly from the adjoining 10 cohorts.
- Nonetheless, it is possible that we don't observe workers born in the 1980s for long enough prior to the great recession.
- So for robustness, we estimate even fewer cohorts. In this case the model estimates that participation among recent cohorts should be higher, and it does less well explaining the recent decline in participation.

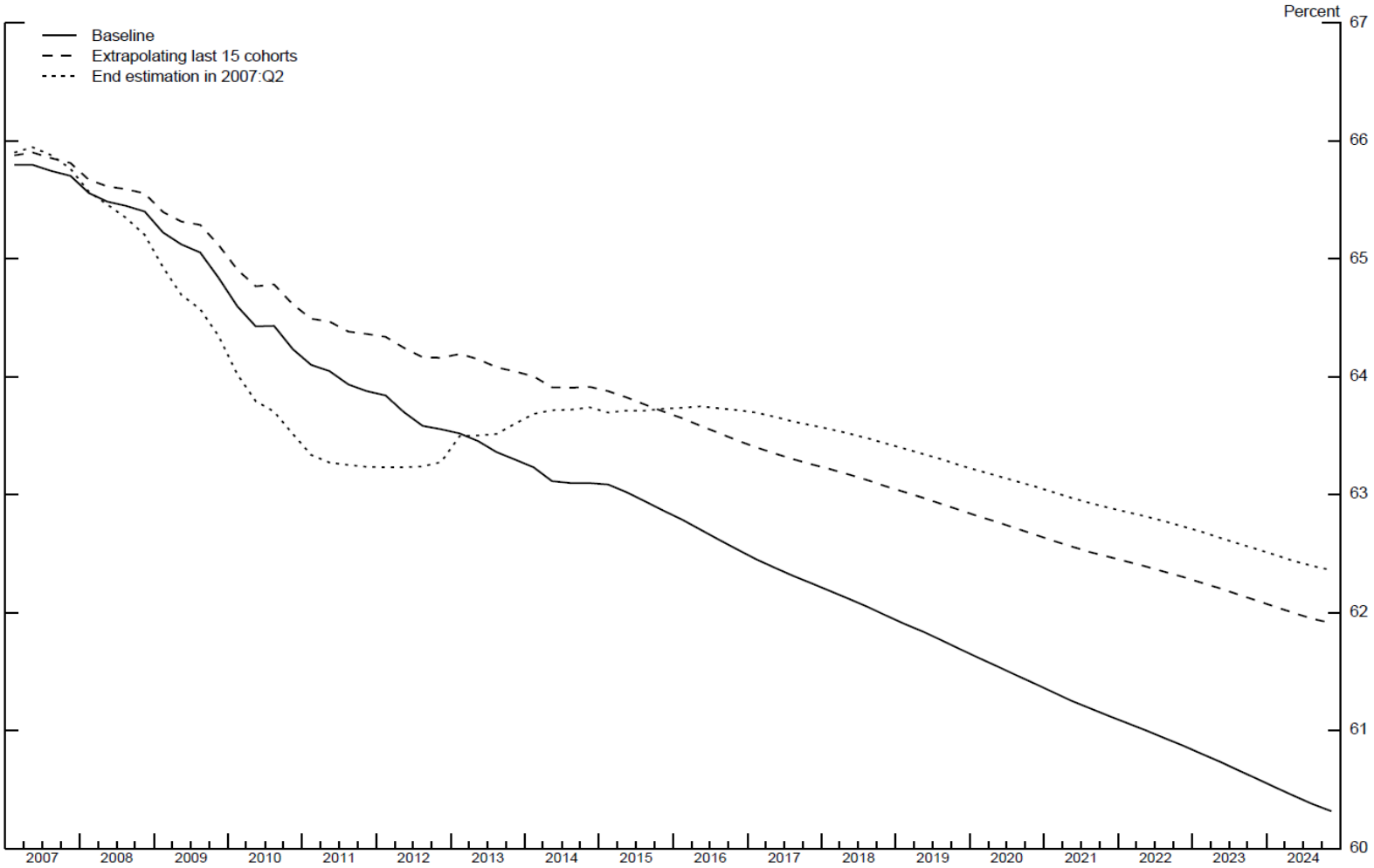
Model Trend, Varying Cohort Extrapolation



Note: Estimation period: 1976:Q1 to 2014:Q2.
Source: Authors' calculations.

From "Labor Force Participation: Recent Developments and Future Prospects" by Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, FEDS WP 2014-64, September 2014.

Alternative Model Projections



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Closing thoughts

- The model captures many features of recent movements in participation rates across demographic groups, such as the flattening out of female participation, the continued decline in participation among men, and rising participation among those of normal retirement age.
- This is not a general equilibrium model. We do not account for any response of employers that might make work more attractive or any policy responses.
- Aging is going to be a very powerful factor in driving participation rates going forward, even if participation rates for older workers continue to rise.
- There is a lot of uncertainty